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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentservices-us@honeywell.com
pmvdocket@welshkatz.com
paul.vargo@huschblackwell.com

Office Action Summary	Application No. 10/535,567	Applicant(s) DAVIES ET AL.	
	Examiner ROBERT EOM	Art Unit 1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 March 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 36-50, 52 and 53 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 36-50, 52, and 53 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 36-50 and 52-53 have been considered but are moot in view of the new ground(s) of rejection.

The applicants have amended independent claims 36 and 45 to positively recite limitations further defining the structural particulars of the claimed gas sensor components, creating new combinations, not previously presented for consideration upon merits for patentability.

Claim Interpretation

2. It is noted that claims 36-50 and 52-53 are directed towards a device for sensing gas. Regarding limitations recited in claims 36-50 and 52-53 which are directed to a manner of operating disclosed gas sensor, it is noted that neither the manner of operating a disclosed device nor material or article worked upon further limit an apparatus claim. Said limitations do not differentiate apparatus claims from prior art. See MPEP § 2114 and 2115. Further, it has been held that process limitations do not have patentable weight in an apparatus claim. See *Ex parte Thibault*, 164 USPQ 666, 667 (Bd. App. 1969) that states "Expressions relating the apparatus to contents thereof and to an intended operation are of no significance in determining patentability of the apparatus claim."

Additionally, regarding the recitation of a method of making said device for sensing gas, the examiner notes that the determination of patentability is determined by the recited structure of the apparatus and not by a method of

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making said structure. A claim containing a recitation with respect to the manner in which a claimed apparatus is made does not differentiate the claimed apparatus from a prior art apparatus if the prior art apparatus teaches all the structural limitations of the claim. In re Thorpe, 777 F.2d 695, 227 USPQ 964 (Fed. Cir. 1985). As the court stated in Thorpe, 777 F.2d at 697, 227 USPQ at 966 (The patentability of a product does not depend on its method of production. In re Pilkington, 411 F.2d 1345, 1348, 162 USPQ 145, 147 (CCPA 1969). If the product in a product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.).

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 36-44, 53 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 36, the limitation “a metal lead frame molded into the base adjacent to the insulating layer and parallel to said floor” renders the claim indefinite. It is unclear as to what structural particulars the limitation is attempting to convey. For the purposes of examination, the limitation will be interpreted in a similar manner as to the language recited in similar claim 45.

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Claim 53 recites the limitation "the circuit frame" in line 6. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary.

Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of

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35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 36-40, 42, and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Howarth (USP 3,481,179), in view of Doncaster et al. (EP 0940680 A2) and Tantram (USP 5,070,721).

Regarding claims 36 and 38, Howarth discloses an apparatus for the detection of combustible gases (**Fig 4-5**) comprising: a cylindrical body (*solid molded base*) (**31**) having an electrode mount (*insulating layer*) (**34**) which is made of a suitable insulating material (**C3/L45-47**); a plurality of lead-in wires (*metal lead frame*) (**37s, 39s**); two gas sensitive elements (*gas sensors*) (**36, 39**); a plurality of contacts which are coupled to the gas sensitive elements and coupled to the lead-in wires (**see: contact wires which extend perpendicularly from the direction of the lead-in wires 37, 38 to which the connect gas sensitive elements 36, 38 are connected thereto**); a ring (*perforated cover*) (**56**) which encloses/contains the components held within the body.

Howarth does not explicitly disclose a second insulating layer overlying the sensor. Doncaster teaches a catalytic gas sensor (**Fig. 1-4**) comprising a plurality of gas sensitive catalytic beads (**1**) insulated by being encapsulated by glass microfibre insulating material (**9**). It would have been obvious to one having ordinary skill in the art at the time of the invention to use glass microfibre insulating material to envelope the gas sensitive elements of Howarth, as taught by Doncaster, since doing so provides for thermally insulating means around the

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gas sensing elements so that it is operable at a relatively high temperature

(Doncaster: [00020]).

Howarth does not explicitly disclose the metal lead frame being disposed parallel to the floor of the cavity. Tantrum teaches a flammable catalytic gas sensor **(Fig. 1)** having leads **(6)** which are disposed in a direction parallel to the floor of the sensor housing. It would have been obvious to one having ordinary skill in the art at the time of the invention to arrange the leads in the aforementioned parallel manner in the gas sensor of modified Howarth, as taught by Tantrum, since it has been held that rearranging parts of an invention involves only routine skill in the art. *In re Japikse*, 86 USPQ 70.

Regarding claim 37, modified Howarth discloses all of the claim limitations as set forth above. Howarth further discloses a charcoal pad diffuser **(44)**. Doncaster further discloses a bronze sinter **(10)** which reacts with hydrogen sulfide to prevent it from reaching the bead.

Regarding claims 39 and 40, modified Howarth discloses all of the claim limitations as set forth above. Howarth further discloses a second diffuser **(57)** which can act as a flame trap. Doncaster further discloses a stainless steel sinter **(12)** to act as a flame trap.

Regarding claims 42 and 43, modified Howarth discloses all of the claim limitations as set forth above. Howarth further discloses the ring (*metal bezel*) **(56)** is fixed by screws to the sensor body **(C4/L10-12)** and encloses/contains the components held within the body.

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9. Claims 41 and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Howarth (USP 3,481,179), in view of Doncaster et al. (EP 0940680 A2) and Tantrum (USP 5,070,721), as applied to claims 36, 37, and 40 above, in further view of Otani et al. (JP 2002-295795, **see: related US Patent 7,479,255 B2**).

Regarding claim 41, modified Howarth discloses all of the claim limitations as set forth above. Modified Howard does not explicitly disclose a second filter located between the cover and the second insulating layer, with the flame arrestor mesh disposed between the two filters. Otani discloses a gas sensor (**JP: Fig 15; USP: Fig, 20**) comprising: a water repelling filter (**44**) disposed between the sintered porous metal sheet (*flame arrestor mesh*) (**43**) and the cap (**60**). It would have been obvious to one having ordinary skill in the art at the time of the invention to incorporate a second filter in the form of a water repelling filter onto the flametrap of modified Howarth, as taught by Otani, since doing so prevent moisture from entering the gas sensor which prevents gas sensing element breakdown and sensitivity lowering and prolong the life of the gas sensor (**Otani USP: C2/L66-C3/L3**).

Regarding claim 44, modified Howarth discloses all of the claim limitations as set forth above. Howarth further discloses the ring (*metal bezel*) (**56**) is fixed by screws to the sensor body (**C4/L10-12**) and encloses/contains the components held within the body.

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10. Claims 45-48, 50, and 52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Doncaster et al. (EP 0940680 A2), in view of Howarth (USP 3,481,179), Daeche et al. (WO 00/00820 see: English language translation), and Tantrum (USP 5,070,721).

Regarding claim 45, Doncaster discloses a gas sensor (**Fig. 1-3**) comprising: a housing (**Fig. 3, see: stainless steel housing 11**) having a closed base and an open end, the housing having walls that surrounds and a cavity with said base (**Fig. 3, see: volume created by housing**); the cavity having an upper first shelf (**Fig. 3, see: "shelf" defined by walls of housing**) and an integral floor (**Fig. 1-2, see: base 8**); a all-metal lead frame comprising four terminals (**Fig. 2, see: terminals 6, 7 for each can 2**) and three lead lines which extend out of the base of the housing (**Fig. 3, see: three leads extending from bottom of gas sensor**); a pair of detectors mounted in the cavities and connected through the lead lines (**Fig. 2, see: catalytic bead 1**); a pair of filters (**Fig. 2, see: bronze sinter 10**); and a metal mesh flame arrestor (**Fig. 3, see: stainless steel sinter 12**).

Doncaster does not explicitly disclose the housing being made of plastic, or a porous metal cover to close the housing. Howarth teaches an apparatus for the detection of combustible gases (**Fig 4-5**) comprising a ring (**56**), fixed by screws to the sensor body (**C4/L10-12**), which encloses/contains the components (gas sensitive element, flame trap, diffuser, etc.) held within the body. It would have been obvious to one having ordinary skill in the art at the time of the invention to incorporate a retention ring in the gas sensor of

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Doncaster, as taught by Howarth, since doing so would provide a mounting system which would prevent the flame trap and other critical components from separating from the housing due to temperature fluctuations, which causes the housing to expand and shrink in size, from the sensing of combustible gases.

Daeche teaches a combustible gas sensor (**Fig. 1-7**) with a housing manufactured by molding plastic directly onto a lead frame (**P5, see: plastic spraying process**). It would have been to one having ordinary skill in the art at the time of the invention to use select plastic as the material for the housing in the gas sensor of Doncaster, as taught by Daeche, since doing so allows a cost advantageous mounting and large-scale manufacture of combustible gas sensors (**Daeche: P4, see: paragraph 3**).

Doncaster does not explicitly disclose the metal lead frame being disposed parallel to the floor of the cavity. Tantrum teaches a flammable catalytic gas sensor (**Fig. 1**) having leads (**6**) which are disposed in a direction parallel to the floor of the sensor housing. It would have been obvious to one having ordinary skill in the art at the time of the invention to arrange the leads in the aforementioned parallel manner in the gas sensor of modified Doncaster, as taught by Tantrum, since it has been held that rearranging parts of an invention involves only routine skill in the art. *In re Japikse*, 86 USPQ 70.

Regarding claim 46, modified Doncaster discloses all of the claim limitations as set forth above. Doncaster further discloses the cavity has a first recess surrounded by a second shelf (**Fig. 2-3, see: volume defined by the walls and “shelf” of the can 2**) which extends to the all-metal electrical

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conducting lead frame; a second recess (**Fig. 2, see: volume defined by well formed in the base 8 which also forms a second “shelf”**) which extends below the upper most plane of the all-metal electrical conducting lead frame; the recesses of the can containing insulating material (**Fig. 2, see: glass microfibre insulating material 9**), the detector (**Fig. 2, see: catalytic bead 1**) being mounted in the second recess to the first and third lead lines through an intermediate section which extends toward the center of the housing base and toward each other and separated from each other, and the second lead line having an end adjacent and separated from the first intermediate section (**Fig. 2, see: terminals 6, 7 which extend towards the center of the housing and to each other are intermediate between the three lead lines seen in Fig. 3 and the catalytic beads 1**).

Regarding claim 47, modified Doncaster discloses all of the claim limitations as set forth above. Doncaster further discloses a second layer of shock absorbing and insulating material located inside the first recess and above the detector (**Fig. 2, see: glass microfibre insulating material 9**).

Regarding claim 48, modified Doncaster discloses all of the claim limitations as set forth above. Doncaster further discloses the filter rests on the second shelf over the first recess (**Fig. 2, see: bronze sinter 10**).

Regarding claim 50, modified Doncaster discloses all of the claim limitations as set forth above. Howarth further discloses the ring (*metal bezel*) (**56**) is fixed by screws to the sensor body (**C4/L10-12**) and encloses/contains the components held within the body.

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Regarding claim 52, modified Doncaster discloses all of the claim limitations as set forth above. Doncaster further discloses the first element, second element, and second layer being glass wool **(C2/L54-60)**.

11. Claim 49 is rejected under 35 U.S.C. 103(a) as being unpatentable over Doncaster et al. (EP 0940680 A2), in view of Howarth (USP 3,481,179), Daeche et al. (WO 00/00820 see: English language translation), and Tantram (USP 5,070,721), as applied to claims 45-48 above, in further view of Otani et al. (JP 2002-295795, **see: related US Patent 7,479,255 B2**).

Regarding claim 49, modified Doncaster discloses all of the claim limitations as set forth above. Modified Doncaster does not explicitly disclose a second filter located on the outboard side of the flame arrestor. Otani discloses a gas sensor **(JP: Fig 15; USP: Fig, 20)** comprising: a water repelling filter **(44)** disposed between the sintered porous metal sheet (*flame arrestor mesh*) **(43)** and the cap **(60)**. It would have been obvious to one having ordinary skill in the art at the time of the invention to incorporate a second filter in the form of a water repelling filter onto the flametrap of modified Doncaster, as taught by Otani, since doing so prevent moisture from entering the gas sensor which prevents gas sensing element breakdown and sensitivity lowering and prolong the life of the gas sensor **(Otani USP: C2/L66-C3/L3)**.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Capetanopolous et al. (USP 5,624,641) teaches a gas sensing assembly.

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ROBERT EOM whose telephone number is (571)270-7075. The examiner can normally be reached on Mon.-Thur., 9:00am-5:00pm, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill Warden can be reached on (571)272-1267. The fax

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phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Tony G Soohoo/
Primary Examiner, Art Unit 1797

/R. E./
Examiner, Art Unit 1797